IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	Date: May 15, 2008
Applicants: Bednorz et al.	Docket: YO987-074BZ
Serial No.: 08/479,810	Group Art Unit: 1751
Filed: June 7, 1995	Examiner: M. Kopec

For: NEW SUPERCONDUCTIVE COMPOUNDS HAVING HIGH TRANSITION TEMPERATURE, METHODS FOR THEIR USE AND PREPARATION

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
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CORRECTED

APPEAL BRIEF

Part V

CFR 37 §41.37(c)(1)(*v*)

Summary of Claimed Subject Matter

Summary of Each Claim Under Appeal

VOLUME 2

The term "original claims" refers to the claims filed in the first filed ancestral application, Appl. No. Application Serial Number 07/053,307 filed 05/22/87 (Brief Attachment AU).

Claims 1, 12, 24, 27, 36, 55, 57, 58, 59, 64, 86 (Allowed), 96, 103 (Allowed), 130, 137 (Allowed), 139, 140 (Allowed), 361, 373, 374, 383, 386 (Allowed), 497 (Allowed) and 535 recited "means for maintaining said composition at said temperature" and "means for passing an electrical superconductive current" or similar means limitation.

Claims 34, 42, 46, 69, 77, 84, 91, 135 (Allowed), 379 (Allowed), 496 (Allowed) and 543 recite "means for passing an electrical superconductive current" or similar recitation.

Applicants specification, the first filed application, (Brief Attachment AU) teaches at page 20, lines 15-19, current source 18 and at page 20, line 23 to page 21, line 2 teaches "a computer was used to provide computer-controlled fully-automated system for temperature variation, data acquisition and processing." As noted in Brief Volume 1 superconductivity was first discovered in 1911. Apparatus for cooling materials to temperatures at which the material became a superconductor have been well known since that time and prior to Applicants' discovery. In addition, the specification teaches at page 2 lines 8 to page 3 line 2 well known uses of superconductors prior to Applicants discovery that would be improved by Applicants' discovery, such as, for example, magnets used in plasma and nuclear plastics, nuclear magnetic resonance, medical diagnostics systems, Josephson type switches and electronic instrumentation, such as magnetic susceptometers and magnetometers. All of these use well known cooling apparatus to place the superconductor in these devices at the temperature necessary to act as superconductors. Some of these are described in "Cryogenic Engineering" by Hands 1986 (Brief Attachment BK) which was submitted with The Ninth Supplemental Response After Final Rejection dated 11-

06-2006, which was not entered by Advisory Action dated 11-15-2007 and which was resubmitted with the Sixteenth Response After Final Rejection dated 01-30-2008, which has not been responded to with an Advisory Action as of the submission of the Corrected Brief. Allowed claims 65, 44, 156, 177-181, 185, 186, 189, 190, 191, 196, 213-216, 235, 247, 258, 259-271, 276, 277, 280-282, 287, 288, 296, 304-307, 375, 388, 396-401, 403, 406, 409, 410, 411-413, 502 and 511-515 recited "a current source" and "a temperature controller" or similar recitation. All of this provides support for "means for an electrical superconductive current" and "means for maintaining said composition at said temperature" or similar recitation in the claims listed above.

Note the summary of each claim includes the correction of the typographical errors noted at page 240, the first page of Section VIII, of Volume 1 of this Corrected Brief. This has been done so that each summary can be understood.

CLAIM 1

Independent CLAIM 1 is directed to a superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining the composition at the temperature to exhibit the superconductivity and a current source for passing an electrical superconducting current through the composition while exhibiting the superconductivity.

Support for claim 1 is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at

page 20 line 1 to page 21, line 2 and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 2

Dependent CLAIM 2 is directed to the superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of the rare earth or rare earth-like element in the composition.

Support is found in original claim 2 at page 29 of the specification.

CLAIM 3

Dependent CLAIM 3 is directed to the superconducting apparatus of claim 2, where the transition metal is Cu.

Support is found in original claim 3 at page 30 of the specification.

CLAIM 4

Dependent CLAIM 4 is directed to the superconducting apparatus of claim 3, where the alkaline earth element is selected from the group consisting of B, Ca, Ba, and Sr.

Support is found in original claim 4 at page 30 of the specification.

CLAIM 5

Dependent CLAIM 5 is directed to the superconducting apparatus of claim 1, where the transition metal element is selected from the group consisting of Cu, Ni, and Cr.

Support is found in original claim 5 at page 30 of the specification.

CLAIM 6

Dependent CLAIM 6 is directed to the superconducting apparatus of claim 2, where the rare earth or rare earth-like element is selected from the group consisting of La, Nd, and Ce.

Support is found in original claim 6 at page 30 of the specification.

CLAIM 7

Dependent CLAIM 7 is directed to the superconducting apparatus of claim 1, where the phase is crystalline with a perovskite-like structure.

Support is found in original claim 7 at page 30 of the specification.
Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) which states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." The conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 8

Dependent CLAIM 8 is directed the superconducting apparatus of claim 2, where the phase is crystalline with a perovskite-like structure.

Support is found in original claim 8 at page 30 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) which states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." The conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 9

Dependent CLAIM 9 is directed to the superconducting apparatus of claim 1, where the phase exhibits a layer-like crystalline structure.

Support is found in original claim 9 at page 30 of the specification.
Support is found in original claim 32 at page 35 of the specification.

Support is found in original claim 32 at page 35 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) which states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." The conclusion at page 192 the article states

"[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 10

Dependent CLAIM 10 is directed to the superconducting apparatus of claim 1, where the phase is a mixed copper oxide phase.

Support is found in original claim 10 at page 31 of the specification.

CLAIM 11

Dependent CLAIM 11 is directed to the superconducting apparatus of claim 1, where the composition is comprised of mixed oxides with alkaline earth doping.

Support is found in original claim 11 at page 31 of the specification.

CLAIM 12

Independent CLAIM 12 is directed to a superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

means for passing a superconducting electrical current through the composition while the composition is at a temperature greater than or equal to 26°K and less than the transition temperature, and

cooling means for cooling the composition to a superconducting state at a temperature greater than or equal to 26°K.

Support for claim 12 is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 13

Dependent CLAIM 13 is directed to the combination of claim 12, where the superconductive composition includes a transition metal oxide.

Support is found in original claim 13 at page 31 of the specification

CLAIM 14

Dependent CLAIM 14 is directed to the combination of claim 12, where the superconductive composition includes Cu-oxide.

Support id found in original claim 14 at page 32 of the specification.

CLAIM 15

Dependent CLAIM 15 is directed to the combination of claim 12, where the superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.

Support is found in original claim 15 at page 32 of the specification.

CLAIM 16

Dependent CLAIM 16 is directed to the combination of claim 15, where the transition metal is Cu.

Support is found in found in original claim 16 at page 32 of the specification.

CLAIM 17

Dependent CLAIM 17 is directed to the combination of claim 15, where the additional element is a rare earth or rare earth-like element.

Support is found in original claim 17 at page 32 of the specification.

CLAIM 18

Dependent CLAIM 18 is directed to the combination of claim 15, where the additional element is an alkaline earth element.

Support is found in original claim 18 at page 32 of the specification.

CLAIM 19

Dependent CLAIM 19 is directed to the combination of claim 12, where the composition includes a perovskite-like superconducting phase.

Support is found in original claim 19 at page 32 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col.,

lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 20

Dependent CLAIM 20 is directed to the combination of claim 12, where the composition includes a substituted transition metal oxide at page 33 of the specification.

Support is found in original claim 20 at page 33 of the specification.

CLAIM 21

Dependent CLAIM 21 is directed to the combination of claim 20, where the substituted transition metal oxide includes a multivalent transition metal element.

Support can be found in original claim 21 at page 33 of the specification.

CLAIM 22

Dependent CLAIM 22 is directed to the combination of claim 20, where the substituted transition metal oxide is an oxide of copper.

Support is found in original claim 22 at page 33 of the specification.

CLAIM 23

Dependent CLAIM 23 is directed to the combination of claim 20, where the substituted transition metal oxide has a layer-like structure.

Support is found in original claim 23 at page 33 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 24

Independent CLAIM 24 is directed to an apparatus comprising:

a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to of 26°K,

means for lowering the temperature of the material at least to the critical temperature to produce the superconducting state in the phase, and

means for passing an electrical superconducting current through the transition metal oxide while it is in the superconducting state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69

(page 46), 77 (pages 49-50),), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 25

Dependent CLAIM 25 is directed to the apparatus of claim 24, where the transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

Support is found in original claim 25 at page 34 of the specification.

CLAIM 26

Dependent CLAIM 26 is directed to the apparatus of claim 24, where the transition metal oxide is comprised of a Cu oxide.

Support is found in original claim 26 at page 34 of the specification.

CLAIM 27

Independent CLAIM 27 is directed to a superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of the composition, means for maintaining the composition at a temperature greater than or equal to the transition temperature to put the

composition in a superconducting state; and a means for passing current through the composition while in the superconducting state.

Support is found in original claim 27 at page 34 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 28

Dependent CLAIM 28 is directed to the superconducting apparatus of claim 27, where the substituted Cu-oxide includes a rare earth or rare earth-like element.

Support is found in original claim 28 at pages 29 to 30 of the specification.

CLAIM 29

Dependent CLAIM 29 is directed to the superconducting apparatus of claim 27, where the substituted Cu-oxide includes an alkaline earth element.

Support is found in original claim 29 at page 35 of the specification.

CLAIM 30

Dependent CLAIM 30 is directed to the superconducting apparatus of claim 29, where the alkaline earth element is atomically large with respect to Cu.

Support is found in original claim 30 at page 35 of the specification.

CLAIM 31

Dependent CLAIM 31 is directed to the superconducting apparatus of claim 27, where the composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.

Support is found in original claim 31 at page 35 of the specification and at page 18, line 20 of the specification.

CLAIM 32

Dependent CLAIM 32 is directed to the superconducting apparatus of claim 31, where the crystalline structure is layer-like, enhancing the number of Jahn-Teller polarons in the composition.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 33

Independent CLAIM 33 is directed to a superconducting apparatus comprising a composition having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a copper oxide doped with an

alkaline earth element where the concentration of the alkaline earth element is near to the concentration of the alkaline earth element where the superconducting copper oxide phase in the composition undergoes an orthorhombic to tetragonal structural phase transition.

Support is found in original claim 33 at pages 35-36 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20.

CLAIM 34

Independent CLAIM 34 is directed to a superconducting apparatus having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in the composition and a current source for passing a superconducting current through the superconducting composition.

Support is found in original claim 34 at page 36 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-5084), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20.

CLAIM 35

Dependent CLAIM 35 is directed to the superconducting apparatus of claim 34, where the doping element includes an alkaline earth element.

Support is found in original claim 35 at age 356 of the specification.

CLAIM 36

Independent CLAIM 36 is directed to a combination comprising:
a composition having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,

means for passing a superconducting electrical current through the composition while the composition is at a temperature greater than or equal to 26°K and less than the superconducting onset temperature, and

means for cooling the composition to a superconducting state at a temperature greater than or equal to 26°K.

Support is found in original claim 36 at pages 36 to 37 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 37

Dependent CLAIM 37 is directed to the combination of claim 36, where the at least one other element is an alkaline earth element.

Support is in original claim 37 at page 37 of the specification.

CLAIM 38

Dependent CLAIM 38 recites the combination of claim 36, where the at least one other element is an element which results in Cu^{3+} ions in the composition.

Support is in original claim 38 at page 37 of the specification.

CLAIM 39

Dependent CLAIM 39 is directed to the combination of claim 36, where the at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions in the composition.

Support is found original claim 39 at page 37 of the specification.

CLAIM 40

Independent CLAIM 40 is directed to an apparatus comprising a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, the superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K, a means for maintaining the superconductor at an operating temperature in excess of the onset temperature to maintain the superconductor in a superconducting

state and a means for passing current through the superconductor while in the superconducting state.

Support is found in original claim 40 at page 38 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 41

Dependent CLAIM 41 is directed to the apparatus of claim 40, where the elements include a transition metal and oxygen.

Support is found in original claim 41 at page 38 of the specification..

CLAIM 42

Independent CLAIM 42 A apparatus having a superconducting onset temperature greater than or equal to 26°K, the superconductor being a doped transition metal oxide, where the transition metal is itself non-superconducting and a current source for passing a superconducting electric current through the composition.

Support is found in original claim 42 at page 38 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of

the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20.

CLAIM 43

Dependent CLAIM 43 is directed to the apparatus of claim 42, where the doped transition metal oxide is multivalent in the superconductor.
Support is found in original claim 42 at page 38 of the specification.

CLAIM 44

Dependent CLAIM 44 is directed to the apparatus of claim 42, further including an element which creates a mixed valent state of the transition metal.

Support is in original claim 44 at page 38 of the specification.

CLAIM 45

Dependent CLAIM 45 is directed to the apparatus of claim 43, where the transition metal is Cu.

Support is found in original claim 45 sat page 39 of the specification.

CLAIM 46

Independent CLAIM 46 is directed to an apparatus having a superconductor having a superconducting onset temperature greater than or equal to 26°K, the superconductor being an oxide having multivalent oxidation states and including a metal, the oxide having a crystalline structure which is oxygen deficient and a means for passing a superconducting electric current through the superconductor.

Support is found in original claim 46 at pages 39 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 47

Dependent CLAIM 47 is directed to the apparatus of claim 46, where the transition metal is Cu.

Support is found in original claim 47 at page 39 of the specification.

CLAIM 48

Independent CLAIM 48 is directed to a superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of the substitutions being sufficient to produce sufficient electron-phonon interactions in the composition that the composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through the superconductor.

Support is found in original claim 48 at page 39 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description

at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 49

Dependent CLAIM 49 is directed to the superconductive apparatus of claim 48, where the transition metal oxide is multivalent in the composition.

Support is in original claim 49 at page 40 of the specification.

CLAIM 50

Dependent CLAIM 50 is directed to the superconductive apparatus of claim 48, where the transition metal is Cu.

Support is found in original claim 50 at page 40 of the specification.

CLAIM 51

Dependent CLAIM 51 is directed to the superconductive apparatus of claim 48, where the substitutions include an alkaline earth element.

Support is found in original claim 51 at page 40 of the specification.

CLAIM 52

Dependent CLAIM 52 is directed to the superconductive apparatus of claim 48, where the substitutions include a rare earth or rare earth-like element.

Support is found in original claim 52 at page 40 of the specification.

CLAIM 53

Independent CLAIM 53 A superconductive apparatus comprised of a copper oxide having a layer-like crystalline structure and at least one additional element substituted in the crystalline structure, the structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.

Support is found in original claim 53 at page 40 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.
Support is found in original claim 9 at page 30 of the specification.
Support is found in original claim 32 at page 35 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 54

Dependent CLAIM 54 is directed to the superconductor of claim 53, where the additional element creates a mixed valent state of the copper oxide in the superconductor.

Support is in original claim 54 at page 41 of the specification.

CLAIM 55

Independent CLAIM 55 is directed to a combination, comprising:

a transition metal oxide having an superconducting onset temperature greater than about 26°K and having an oxygen deficiency, the transition metal being non-superconducting at the superconducting onset temperature and the oxide having multivalent states,

means for passing an electrical superconducting current through the oxide while the oxide is at a temperature greater than or equal to 26°K, and

means for cooling the oxide in a superconducting state at a temperature greater than or equal to 26°K.

Support is found in original claim 55 at page 41 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 56

Dependent CLAIM 56 is directed to the combination of claim 55, where the transition metal is Cu.

Support I in original claim 56 at page 41 of the specification.

CLAIM 57

Independent CLAIM 57 is directed to a combination including;

a superconducting oxide having a superconducting onset temperature greater than or equal to 26°K and containing at least 3 elements which are non-superconducting at the onset temperature,

means for passing a superconducting current through the oxide while the oxide is maintained at a temperature greater than or equal to 26°K, and

means for maintaining the oxide in a superconducting state at a temperature greater than or equal to 26°K and less than the superconductive onset temperature.

Support is found in original claim 57 at page 42 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 58

Independent CLAIM 58 is directed to a combination, comprised of:

a copper oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in the oxide, the oxide being crystalline and having a layer-like structure,

means for passing a superconducting current through the copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than the superconducting onset temperature, and

means for cooling the copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than the superconducting onset temperature.

Support is found in original claim 58 at pages 42 and 43 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 59

Independent CLAIM 59 is directed to a combination, comprised of:

a ceramic-like material having an onset of superconductivity at an onset temperature greater than or equal to 26°K,

means for passing a superconducting electrical current through the ceramic-like material while the material is maintained at a temperature greater than or equal to 26°K and less than the onset temperature, and

means for cooling the superconducting ceramic-like material to a superconductive state at a temperature greater than or equal to 26°K and less than the onset temperature, the material being superconductive at temperatures below the onset temperature and a ceramic at temperatures above the onset temperature.

Support is found in original claim 59 at page 43 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 60

Independent CLAIM 60 is directed to an apparatus comprised of a transition metal oxide, and at least one additional element, the superconductor having a

distorted crystalline structure characterized by an oxygen deficiency and exhibiting a superconducting onset temperature greater than or equal to of 26°K, a source of current for passing a superconducting electric current in the transition metal oxide, and a cooling apparatus for maintaining the transition metal oxide below the onset temperature at a temperature greater than or equal to 26°K.

Support is found in original claim 60 at pages 43 and 44 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 61

Dependent CLAIM 61 is directed to the apparatus of claim 60, where the transition metal is Cu.

Support is in original claim 61 at page 44 of the specification.

CLAIM 62

Independent CLAIM 62 is directed to an apparatus comprised of a transition metal oxide and at least one additional element, the superconductor having a distorted crystalline structure characterized by an oxygen excess and exhibiting a superconducting onset temperature greater than or equal to 26°K, a source of current for passing a superconducting electric current in the transition metal oxide, and a cooling apparatus for maintaining the transition metal oxide below the onset temperature and at a temperature greater than or equal to of 26°K.

Support is found in original claim 62 at page 44 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 63

Dependent CLAIM 63 is directed to the apparatus of claim 62, where the transition metal is Cu.

Support is in original claim 63 at page 44 of the specification.

CLAIM 64

Independent CLAIM 64 is directed to a combination, comprising:

a mixed copper oxide composition having enhanced polaron formation, said composition including an element causing the copper to have a mixed valent state in the composition, said composition further having a distorted octahedral oxygen environment leading to a T_c greater than or equal to 26°K,

means for providing a superconducting current through the composition at temperatures greater than or equal to 26°K and less than the T_c, and

means for cooling the composition to a temperature greater than or equal to 26°K and less than the T_c.

Support is found in original claim 64 at pages 44 to 45 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 65

CLAIM 65 is allowed.

CLAIM 66

Independent CLAIM 66 is directed to an apparatus comprising a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, the composition having a distorted orthorhombic crystalline structure, a source of current for passing a superconducting electric current in the transition metal oxide, and a cooling apparatus for maintaining the transition metal oxide below the onset temperature and at a temperature greater than or equal to 26°K.

Support is found in original claim 66 at pages 45 to 46 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55

(page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 67

Dependent CLAIM 67 is directed to the apparatus of claim 66, where the transition metal oxide is a mixed copper oxide.

Support is found in original claim 67 at page 46 of the specification.

CLAIM 68

Dependent CLAIM 68 is directed to the apparatus of claim 67, where the one additional element is an alkaline earth element.

Support is found in original claim 68 at page 46 of the specification.

CLAIM 69

Independent CLAIM 69 is directed to a superconductive combination, comprising:

a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, the composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and

means for passing a superconducting electrical current through the composition while the composition is at a temperature greater than or equal to 26°K and less than the superconducting transition temperature.

Support is found in original claim 69 at page 46 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 70

Dependent CLAIM 70 is directed to the combination of claim 69, where the transition metal oxide is a mixed copper oxide.

Support is found in original claim 70 at page 47 of the specification.

CLAIM 71

Dependent CLAIM 71 is directed to the combination of claim 70, where the mixed copper oxide includes an alkaline earth element.

Support is found in original claim 71 at page 47 of the specification.

CLAIM 72

Dependent CLAIM 72 is directed to the combination of claim 71, where the mixed copper oxide further includes a rare earth or rare earth-like element.

Support is found in original claim 72 at page 47 of the specification.

CLAIM 73 to 76 are withdrawn.

CLAIM 77 -81 are allowed.

CLAIMS 82 and 83 are withdrawn.

CLAIM 84

Independent CLAIM 84 is directed to a superconducting combination, comprising:

a mixed transition metal oxide composition containing a non-stoichiometric amount of oxygen therein, a transition metal and at least one additional element, the composition having substantially zero resistance to the flow of electricity therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, the mixed transition metal oxide has a superconducting onset temperature greater than or equal to 26°K, and

electrical means for passing an electrical superconducting current through the composition when the composition is in the superconducting state at a temperature greater than or equal to 26°K, and less than the superconducting onset temperature.

Support is found in original claim 84 at page 52 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-5084 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the

description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 85

Dependent CLAIM 85 is directed to the combination of claim 84, where the transition metal is copper.

Support is in original claim 84 at page 82 of the specification.

CLAIMS 86 and 87 are allowed.

CLAIM 88

Independent CLAIM 88 is directed to an apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a cooler for cooling the composition to a temperature greater than or equal to 26°K at which temperature the composition exhibits the superconductive state, and

a current source for passing an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claim 88 at pages 53 to 54) of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20,

18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 89

Dependent CLAIM 89 is directed to the apparatus of claim 88, where the composition is comprised of a metal oxide.

Support is found I original claim 89 at page 54 of the specification.

CLAIM 90

Dependent CLAIM 90 is directed to the apparatus of claim 88, where the composition is comprised of a transition metal oxide.

Support I in original claim 90 at page 54 of the specification.

CLAIM 91

Independent CLAIM 91 is directed to a combination, comprising:

a composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, and

means for passing an electrical current through the composition while it is in the substantially zero resistance state.

Support is found at page 10, lines 1-3, page 20, lines 1-5 of the specification. Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69

(page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.

CLAIM 92

Dependent CLAIM 92 is directed to the combination of claim 91, where the composition is a copper oxide.

Support is found in original claim 10 at page 31 of the specification.

CLAIM 93

Independent CLAIM 93 is directed to an apparatus, comprising:

a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and

a current source for producing an electrical current through the copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original

claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

CLAIM 94

Dependent CLAIM 94 is directed to the apparatus of claim 93, where the copper oxide material exhibits a layer-like crystalline structure.
Support is found in original claim 53 at page 40 of the specification.
Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIM 95

Dependent CLAIM 95 is directed to the apparatus of claim 93, where the copper oxide material exhibits a mixed valence state.

Support is found in original claim 36 at page 36 of the specification.

CLAIM 96

Independent CLAIM 96 is directed to a superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) means for causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 97 to 99 are allowed.

CLAIM 100

CLAIM 100 The superconductive apparatus according to claim 96 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 101

Dependent CLAIM 101 is directed to the superconductive apparatus according to claim 100 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found in original claim 81 at page 51 of the specification.

CLAIM 102

Dependant CLAIM 102 is directed to the superconductive apparatus according to claim 101 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIMS 103 to 108 are allowed.

CLAIM 109

Independent CLAIM 109 is directed to a superconductive apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining the composition at the temperature to exhibit the superconductivity and means for passing an electrical superconducting current through the composition while exhibiting the superconductivity.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 110

Dependent CLAIM 110 is directed to the combination of claim 15, where the additional element is rare earth or alkaline earth element.

Support is found at page 12 lines 6-8 of the specification and in the paragraph bridging pages 6 and 7.

CLAIM 111

Independent CLAIM 111 is directed to a device comprising a superconducting transition metal oxide having a superconductive onset temperature greater than or equal to 26°K, the superconducting transition metal oxide being at a temperature less than the superconducting onset temperature and having a superconducting current flowing therein.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 112

Independent CLAIM 112 is directed to a device comprising a superconducting copper oxide having a superconductive onset temperature greater than or equal to 26°K, the superconducting copper oxide being at a temperature less than the superconducting onset temperature and having a superconducting current flowing therein.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and

Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIMS 113 and 114 are allowed.

CLAIM 115

Independent CLAIM 115 is directed to a device comprising a transition metal oxide having a T_c greater than or equal to 26^{o}K carrying a superconducting current the transition metal oxide is maintained at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 116

Independent CLAIM 116 is directed to an apparatus comprising a transition metal oxide having a T_c greater than or equal to 26^{o}K carrying a superconducting current the transition metal oxide is maintained at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 117

Independent CLAIM 117 is directed to a structure comprising a transition metal oxide having a T_c greater than or equal to 26^{o}K carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 118

Independent CLAIM 118 is directed to an apparatus comprising a transition metal oxide having a T_c greater than or equal to 26°K carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 119

Independent CLAIM 119 is directed to a device comprising a copper oxide having a T_c greater than or equal to 26°K carrying a superconducting current the copper oxide is maintained at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 120

Independent CLAIM 120 is directed to an apparatus comprising a copper oxide having a T_c greater than or equal to 26°K carrying a superconducting current the copper oxide is maintained at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 121

Independent CLAIM 121 is directed to a device comprising a copper oxide having a T_c greater than or equal to 26°K carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 122

Independent CLAIM 122 is directed to an apparatus comprising a copper oxide having a T_c greater than or equal to 26^{o}K carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIMS 123 to 125 are allowed

CLAIM 126

Independent CLAIM 126 is directed to a device comprising a composition of matter having a T_c greater than or equal to 26^{o}K carrying a superconducting current, the composition comprising at least one each of a rare earth, and copper oxide.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 127

Independent CLAIM 127 is directed to a device comprising a composition of matter having a T_c greater than or equal to 26^oK carrying a superconducting current, the composition comprising at least one each of a IIIB element, and copper oxide.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 128

Independent CLAIM 128 is directed to a transition metal oxide device comprising a T_c greater than or equal to 26°K and carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 129

Independent CLAIM 129 I directed to a copper oxide device comprising a T_C greater than or equal to 26°K and carrying a superconducting current.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 130

Independent CLAIM 130 is directed to a superconductive apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or Group III B element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining the composition at the temperature to exhibit the superconductivity and means for passing an electrical superconducting current through the composition which exhibiting the superconductivity.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 131

Dependent CLAIM 131 is directed to combination of claim 15, where the additional element is a rare earth or Group III B element.

Support is found in original claim 17 at page 32 of the specification.

CLAIM 132

Dependent CLAIM 132 is directed to the combination of claim 12, where the composition includes a substantially perovskite superconducting phase.

Support is found in original claim 19 at page 32 of the specification. Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 133

Dependent CLAIM 133 is directed to the superconducting apparatus of claim 27, where the substituted Cu-oxide includes a rare earth or Group III B element.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 134

Dependent CLAIM 134 is directed to the combination of claim 71, where the mixed copper oxide further includes a rare earth or Group III B element.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 135 to 138 are allowed.

CLAIM 139

Independent CLAIM 139 is directed to a superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) means for causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.
Support is found in original claim 32 at page 35 of the specification.

Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 140 is allowed.

CLAIM 141

Independent CLAIM 141 is directed to an apparatus comprising a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a temperature controller maintaining the temperature of the material at a temperature less than the critical temperature to produce the superconducting state in the phase, and

a current source passing an electrical supercurrent through the transition metal oxide while it is in the superconducting state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 142

Dependent CLAIM 142 is directed to the apparatus of claim 141, where the transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

Support can be found at page 5, lines 1-10 of the specification.

CLAIM 143

Dependent CLAIM 143 is directed to the apparatus of claim 141, where the transition metal oxide is comprised of a Cu oxide.

Support can be found at page 6, lines 1-10 of the specification.

CLAIMS144 to 145 are allowed.

CLAIM 146

Independent CLAIM 146 is directed to an apparatus:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a temperature controller maintaining the composition at a temperature greater than or equal to 26°K at which temperature the composition exhibits the superconductive state, and

a current source passing an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 147

Dependent CLAIM 147 is directed to the apparatus of claim 146, where the composition is comprised of a metal oxide.

Support is found in original claim 89.

CLAIM 148

Dependent CLAIM 148 is directed to the apparatus of claim 146, where the composition is comprised of a transition metal oxide.

Support is found in original claim 89.

CLAIM 149

Independent CLAIM 149 is directed to a superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 150 to 152 are allowed.

CLAIM 153

Dependent CLAIM 153 is directed to the superconductive apparatus according to claim 149 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36 of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 154

Dependent CLAIM 154 is directed to the superconductive apparatus according to claim 153 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found in original claim 81 and 82 at page 51 and claims 84 and 86 at pages 52 to 53 of the specification.

CLAIM 155

CLAIM 155 The superconductive apparatus according to claim 154 in which oxygen is present in the copper-oxide compound in a non atomic proportion.

Support is found in original claims 81 and 82 at page 51 and claims 84 and 86 at pages 52 and 53 of the specification.

CLAIM 156 to 161 are allowed.

CLAIM 162

Independent CLAIM 162 is directed to an apparatus comprising copper oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to $26^{o}K$;

a temperature controller maintaining the temperature of the material at a temperature less than the critical temperature to produce the superconducting state in the phase;

a current source passing an electrical supercurrent through the copper oxide while it is in the superconducting state;

the copper oxide includes at group consisting of a Group II A element, a rare earth element and a Group III B element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIM 163

Independent CLAIM 163 is directed to an apparatus comprising:

a composition comprising copper, oxygen and any element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, where the composition is a mixed copper oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller maintaining the composition in the superconducting thee at a temperature greater than or equal to 26°K; and

a current source passing an electrical current through the composition while the composition is in the superconducting state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 164

Independent CLAIM 164 is directed to an apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller maintaining the composition at a temperature greater than or equal to 26°K at which temperature the composition exhibits the superconductive state;

a current source passing an electrical current through the composition while the composition is in the superconductive state; and

the composition including a copper oxide and an element selected from the group consisting of Group II A element, a rare earth element and a Group III B element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 165

Independent CLAIM 165 is directed to an apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 166

CLAIM 166 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 167 to 181 are is allowed.

CLAIM 182

Independent CLAIM 182 is directed to an apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a temperature controller maintaining the composition at the temperature to exhibit the superconductivity and a current source passing an electrical superconducting current through the composition with the phrase exhibiting the superconductivity. Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 183

Independent CLAIM 183 is directed to an apparatus comprising a superconducting transition metal oxide having a superconductive onset temperature greater than or equal to 26°K, a temperature controller maintaining the superconducting transition metal oxide at a temperature less than the superconducting onset temperature and a current source flowing a superconducting current therein.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 184

Independent CLAIM 184 is directed to an apparatus comprising a superconducting copper oxide having a superconductive onset temperature greater than or equal to 26°K, a temperature controller maintaining the superconducting copper oxide at a temperature less than the superconducting onset temperature and a current source flowing a superconducting current in the superconducting oxide.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 185 to 186 are allowed.

CLAIM 187

Independent CLAIM 187 is directed to an apparatus comprising a superconducting electrical current in a transition metal oxide having a T_c greater than or equal to 26°K and maintaining the transition metal oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 188

Independent CLAIM 188 is directed to an apparatus comprising a current source flowing a superconducting current in a copper oxide having a T_c greater than or equal to 26°K and a temperature controller maintaining the copper oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 189 to 191 are allowed.

Independent CLAIM 192 is directed to an apparatus comprising a current source flowing a superconducting electrical current in a composition of matter having a T_c greater than or equal to 26°K, the composition comprising at least one each of a rare earth, and copper oxide and a temperature controller maintaining the composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 193

Independent CLAIM 193 is directed to an apparatus comprising a current source flowing a superconducting electrical current in a composition of matter having a T_c greater than or equal to 26°K carrying, the composition comprising at least one each of a Group III B element, and copper oxide and a temperature controller maintaining the composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 194

Independent CLAIM 194 is directed to an apparatus comprising a current source flowing a superconducting electrical current in a transition metal oxide comprising a T_c greater than or equal to 26°K and a temperature controller maintaining the transition metal oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and

Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 195

Independent CLAIM 195 is directed to an apparatus comprising a current source flowing a superconducting electrical current in a copper oxide composition of matter comprising a T_c greater than or equal to 26^oK and a temperature controller maintaining the copper oxide composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 196 and 197 are allowed.

CLAIM 198

Independent CLAIM 198 is directed to a superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.

Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 199

Dependent CLAIM 199 is directed to the superconductive apparatus according to claim 198 in which the copper-oxide compound of the superconductive composition includes at least one element selected from the group consisting of a rare-earth element, a Group III B element and an alkaline-earth element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 200

Dependent CLAIM 200 is directed to the superconductive apparatus according to claim 199 in which the rare-earth is lanthanum.

Support is found in original claim 6 at page 30 of the specification.

CLAIM 201

Dependent CLAIM 201 is directed to the superconductive apparatus according to claim 199 in which the alkaline-earth element is barium.

Support is found in original claim 6 at page 30 of the specification.

CLAIM 202

Dependent CLAIM 202 is directed to the superconductive apparatus according to claim 198 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 203

Dependent CLAIM 203 is directed to the superconductive apparatus according to claim 202 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 204

Dependent CLAIM 204 is directed to the superconductive apparatus according to claim 203 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 205

Independent CLAIM 205 is directed a superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a rare-earth element, a Group III B element and an alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 206

Dependent CLAIM 206 is directed to the superconductive apparatus according to claim 205 in which the at least one element is lanthanum.

Support is found in original claim 6 at page 30 of the specification.

CLAIM 207

Dependent CLAIM 207 is directed to the superconductive apparatus according to claim 205 in which the alkaline-earth element is barium.

Support is found in original claim 4 at page 30 of the specification.

CLAIM 208

Dependent CLAIM 208 is directed to the superconductive apparatus according to claim 205 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 209

Dependent CLAIM 209 is directed to the superconductive apparatus according to claim 208 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 210

Dependent CLAIM 210 is directed to the superconductive apparatus according to claim 209 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 211

Independent CLAIM 211 is directed to a superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26^{o}K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26^{o}K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26^{o}K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 212

Independent CLAIM 212 is directed to a superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the

composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=o}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article

states “[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure.”

CLAIM 213 to 215 are allowed.

CLAIM 216

Independent CLAIM 216 is directed to a superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound having a substantially layered perovskite crystal structure, the transition metal-oxide compound including a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26^oK;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the

specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 217

Dependent CLAIM 217 is directed to an apparatus according to claim 182 wherein the composition comprises a substantially layered perovskite crystal structure.

Support is found at page 26, line 8-25 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three

individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 218

Dependent CLAIM 218 is directed to an apparatus according to claim 183 wherein the superconducting transition (SIC) metal oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 and 13 at page 31 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms … revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 219

Dependent CLAIM 219 is directed to an apparatus according to claim 184 wherein the superconducting copper oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 220 and 221 are allowed.

CLAIM 222

Dependent CLAIM 222 is directed to an apparatus according to claim 187 wherein the transition (SIC) metal oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 223

Dependent CLAIM 223 is directed to an apparatus according to claim 188 wherein the copper oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CALIMS 224 TO 226 are allowed.

CLAIM 227

Dependent CLAIM 227 is directed to an apparatus according to claim 192 wherein the composition of matter comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 228

Dependent CLAIM 228 is directed to an apparatus according to claim 193 wherein the composition of matter comprises substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 229

Dependent CLAIM 229 is directed to an apparatus according to claim 194 wherein the transition (SIC) metal oxide comprises substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 230

Dependent CLAIM 230 is directed to an apparatus according to claim 195 wherein the copper oxide composition comprises substantially layered perovskite crystal structure.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 231 is allowed.

CLAIM 232

Independent CLAIM 232 is directed to an apparatus comprising:

a transition metal oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to $26^{o}K$,

a temperature controller for maintaining the temperature of the material at a temperature less than the critical temperature to produce the superconducting state in the phase, and

a source of an electrical supercurrent through the transition metal oxide while it is in the superconducting state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 233

Dependent CLAIM 233 is directed to an apparatus according to claim 232, where the transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

Support is found in original claim1 at page 29 of the specification.

CLAIM 234

Dependent CLAIM 234 is directed to an apparatus according to claim 232, where the transition metal oxide is comprised of a Cu oxide.
Support is found in original claim 22 at page 33 of the specification.

CLAIMS 235 and 236 are allowed.

CLAIM 237

Independent CLAIM 237 is directed to an apparatus comprising:
a composition exhibiting a superconductive state at a temperature greater than or equal to 26^{o}K, a temperature controller for maintaining the composition at a temperature greater than or equal to 26^{o}K at which temperature the composition exhibits the superconductive state, and
a source of an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

CLAIM 238

Dependent CLAIM 238 is directed to an apparatus according to claim 237, where the composition is comprised of a metal oxide.

Support is in original claim 89 on page 54 of the specification.

CLAIM 239

Dependent CLAIM 239 is directed to an apparatus according to claim 238, where the composition is comprised of a transition metal oxide.
Support is in original claim 90 on page 54 of the specification.

CLAIM 240

Independent CLAIM 240 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;
(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col.,

lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 241 to 243 are allowed.

CLAIM 244

Dependent CLAIM 244 is directed to An apparatus according to claim 240 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 245

Dependent CLAIM 245 is directed to An apparatus according to claim 244 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 247

Dependent CLAIM 246 is directed to an apparatus according to claim 245 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIMS 247 to 252 are allowed.

CLAIM 253

Independent CLAIM 253 is directed to an apparatus comprising:

a copper oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to $26^{o}K$;

a temperature controller for maintaining the temperature of the material at a temperature less than the critical temperature to produce the superconducting state in the phase;

a source of an electrical supercurrent through the copper oxide while it is in the superconducting state;

the copper oxide includes at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIM 254

Independent CLAIM 254 is directed to an apparatus comprising:

a composition including copper, oxygen and an element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, where the composition is a mixed copper oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to $26^{o}K$;

a temperature controller for maintaining the composition in the superconducting state at a temperature greater than or equal to $26^{o}K$; and

a source of an electrical current through the composition while the composition is in the superconducting state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIM 255

Independent CLAIM 255 is directed to an apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to $26^{o}K$;

a temperature controller for maintaining the composition at a temperature greater than or equal to $26^{o}K$ at which temperature the composition exhibits the superconductive state;

a source of an electrical current through the composition while the composition is in the superconductive state; and

the composition including a copper oxide and an element selected from the group consisting of Group II A element, a rare earth element and a Group III B element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIM 256

Independent CLAIM 256 is directed to an apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26^{o}K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26^{o}K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article

states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 257

Independent CLAIM 257 is directed to an apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the

specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 258 TO 267 are allowed.

CLAIM 268

Independent CLAIM 268 is directed to an apparatus comprising:

a copper oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to $26^{o}K$;

a temperature controller for maintaining the temperature of the material at a temperature less than the critical temperature to produce the superconducting state in the phase;

a source for an electrical supercurrent through the copper oxide while it is in the superconducting state;

the copper oxide includes at least one element selected from group consisting of a Group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIMS 269 TO 272 are allowed.

CLAIM 273

Independent CLAIM 273 is directed to an apparatus comprising a composition comprising a transition temperature greater than or equal to 26°K, the composition including a rare earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a temperature controller for maintaining the composition at the temperature to exhibit the superconductivity and a source of an electrical superconducting current through the composition with the phrase exhibiting the superconductivity.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

CLAIM 274

Independent CLAIM 274 is directed to an apparatus comprising providing a superconducting transition metal oxide comprising a superconductive onset temperature greater than or equal to 26°K, a temperature controller for maintaining the superconducting transition metal oxide at a temperature less than the superconducting onset temperature and a source of a superconducting current therein.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 275

Independent CLAIM 275 is directed to an apparatus comprising a superconducting copper oxide comprising a superconductive onset temperature greater than or equal to 26°K, a temperature controller for maintaining the superconducting copper oxide at a temperature less than the superconducting onset temperature and a source of a superconducting current in the superconducting oxide.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIMS 276 to 277 are allowed.

CLAIM 278

Independent CLAIM 278 is directed to an apparatus comprising a source of a superconducting electrical current in a transition metal oxide comprising a T_c greater than or equal to 26^oK and a temperature controller for maintaining the transition metal oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIM 279

Independent CLAIM 279 is directed to an apparatus comprising a source of a superconducting current in a copper oxide comprising a T_c greater than or equal to 26^{o}K and a temperature controller for maintaining the copper oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

CLAIMS 280 to 282 are allowed.

CLAIM 283

Independent CLAIM 283 is directed to an apparatus comprising a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26^{o}K, the composition comprising at least one each of a

rare earth, and copper oxide and a temperature controller for maintaining the composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 284

Independent CLAIM 284 is directed to an apparatus comprising a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26^{o}K carrying, the composition comprising at least one each of a III B element, and copper oxide and a temperature controller for maintaining the composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 285

Independent CLAIM 285 is directed to an apparatus comprising a source of a superconducting electrical current in a transition metal oxide comprising a T_c greater than or equal to 26°K and a temperature controller for maintaining the transition metal oxide at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification

CLAIM 286

Independent CLAIM 286 is directed to an apparatus comprising a source of a superconducting electrical current in a copper oxide composition of matter comprising a T_c greater than or equal to 26°K and a temperature controller for

maintaining the copper oxide composition of matter at a temperature less than the T_c.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification.

CLAIMS 287 to 288 are allowed.

CLAIM 289

Independent CLAIM 289 is directed to an apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26^{o}K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26^{o}K;

b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26^{o}K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 290

Dependent CLAIM 290 is directed to an apparatus according to claim 289 in which the copper-oxide compound of the superconductive composition includes at least one element selected from the group consisting of a rare-earth element and a Group III B element and at least one alkaline-earth element.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

CLAIM 291

Dependent CLAIM 291 is directed to an apparatus according to claim 290 in which the rare-earth or element is lanthanum.

Support is found in original claim 6 at page 30 of the specification.

CLAIM 292

Dependent CLAIM 292 is directed to an apparatus according to claim 290 in which the alkaline-earth element is barium.

Support is found in original claim 4 at page 30 of the specification.

CLAIM 293

Dependent CLAIM 293 is directed to an apparatus according to claim 289 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

CLAIM 294

Dependent CLAIM 294 is directed to an apparatus according to claim 293 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.
CLAIM 295 An apparatus according to claim 294 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 296 to 301 are allowed.

CLAIM 302

Independent CLAIM 302 is directed to an apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to $26^{o}K$, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to $26^{o}K$, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to $26^{o}K$ and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. Support is found at page 11, lines 1-19 of the specification. Support is found in original claims 81 and 82 at page 51 and claim 84 and 86 at pages 52 to 53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 303

Independent CLAIM 303 is directed to an apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an

effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and
(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 304 to 307 are allowed

CLAIM 308

Dependent CLAIM 308 is directed to an apparatus according to claim 273 wherein the composition comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 309

Dependent CLAIM 309 is directed to an apparatus according to claim 274 wherein the superconducting transition (SIC) metal oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 310

Dependent CLAIM 310 is directed to an apparatus according to claim 275 wherein the superconducting copper oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 311 to 312 are allowed.

CLAIMS 313

Dependent CLAIM 313 is directed to an apparatus according to claim 278 wherein the transition (SIC) metal oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article

states “[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure.”

CLAIM 314

Dependent CLAIM 314 is directed to an apparatus according to claim 279 wherein the copper oxide comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants’ article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom “X-ray powder diffractograms ... revealed three individual crystallographic phases.” In the conclusion at page 192 the article states “[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure.”

CLAIMS 315 to 317 are allowed.

CLAIM 318

Dependent CLAIM 318 is directed to an apparatus according to claim 283 wherein the composition of matter comprises a substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 319

Dependent CLAIM 319 is directed to an apparatus according to claim 284 wherein the composition of matter comprises substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 320

Dependent CLAIM 320 is directed to an apparatus according to claim 285 wherein the transition metal oxide comprises substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 321

Dependent CLAIM 321 is directed to an apparatus according to claim 286 wherein the copper oxide composition comprises substantially layered perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.
Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 322

Dependent CLAIM 322 is directed to a superconductive combination according to anyone of claims 84 or 85, wherein the mixed transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 323

Dependent CLAIM 323 is directed to an apparatus according to anyone of claims 86, 87, 144, 146, 147, 163, 164, 168, 169, 173, 174, 178, 182, 189, 196, 197, 214, 224, 235, 236, 237, 239, 254, 255, 259, 260, 264, 265 or 273, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 324

Dependent CLAIM 324 is directed to a combination according to anyone of claims 91, 92 or 36 to 39, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 325

Dependent CLAIM 325 is directed to a superconductive apparatus according to anyone of claims 1 to 11, 33 to 35, 66 to 68,109, 130, 361-366 or 370, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 326

Dependent CLAIM 326 is directed to an apparatus according to anyone of claims 93 to 95 or 138, wherein the mixed copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 327

Dependent CLAIM 327 is directed to combination according to anyone of claims 64 or 135, wherein the mixed copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-23 and page 15, line 20-23.

CLAIM 328

Dependent CLAIM 328 is directed to a superconductive apparatus according to anyone of claims 48 to 52, 96 to 108, 198 to 204, 371, 383 or 384, wherein the superconductive composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 329

Dependent CLAIM 329 is directed to a superconductive combination according to anyone of claims 12 to 23, 110, 131, 132 or 367-370, wherein the superconductive composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 330 is allowed.

CLAIM 331

CLAIM 331 A device according to claim 111, wherein the superconductive transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 332

Dependent CLAIM 332 is directed to an apparatus according to anyone of claims 183, 217, 218, 274 or 309, wherein the superconductive transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 333

Dependent CLAIM 333 is directed to a device according to claim 112, wherein the superconductive copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 334

Dependent CLAIM 334 is directed to an apparatus according to anyone of claims 275, 276, 310 or 311, wherein the superconductive copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 335 is allowed.

CLAIM 336 is allowed.

CLAIM 337

Dependent CLAIM 337 is directed to a device according to anyone of claims 114 or 117, wherein the transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 338

Dependent CLAIM 338 is directed to an apparatus according to anyone of claims 24 to 26, 60 to 63, 116, 141 to 143, 172, 187, 222, 232 to 234, 263, 278, 285, 287, 288, 313 or 320, wherein the transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 339

Dependent CLAIM 339 is directed to a superconductive apparatus according to anyone of claims 27-32, 132 or 370, wherein the transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 340

Dependent CLAIM 340 is directed to An invention according to claim 118, wherein the transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 341

Dependent CLAIM 341 is directed to a transition metal oxide device according to claim 128, wherein the transition metal oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 342

Dependent CLAIM 342 is directed to a apparatus according to anyone of claims 40 to 45, wherein the superconductor can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 343

Dependent CLAIM 343 is directed to a device according to anyone of claims 119 or 121, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 344

Dependent CLAIM 344 is directed to an apparatus according to claim 120, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 345

Dependent CLAIM 345 is directed to an invention according to claim 122, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 346

Dependent CLAIM 346 is directed to a superconductive apparatus according to claim 123, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 347

Dependent CLAIM 347 is directed to a copper oxide device according to claim 129, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 348

Dependent CLAIM 348 is directed to an apparatus according to anyone of claims 162, 167, 177, 188, 223, 253, 258, 268, 269, 270, 279 or 314, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 349

Dependent CLAIM 349 is directed to a combination according to claim 57, wherein the superconductive oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 350

Dependent CLAIM 350 is directed to a combination according to anyone of claims 58 or 373, wherein the copper oxide conductor can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 351

Dependent CLAIM 351 is directed to a combination according to claim 59, wherein the ceramic-like material can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 352

Dependent CLAIM 352 is directed to a superconductive combination according to anyone of claims 69 to 71 or 134, wherein the superconductive composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 353

Dependent CLAIM 353 is directed to a superconductive apparatus according to anyone of claims 139, 140, 149 to 155, 156 to 161, 170, 171, 175, 176, 180, 181, 205 to 216, 387-393, or 396-401, wherein the superconductive composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 354

Dependent CLAIM 354 is directed to an apparatus according to anyone of claims 165, 166, 185, 220, 240 to 246, 247 to 252, 261, 262, 289, 290 to 301, 394, 395, 402-406, 409 or 410, wherein the superconductive composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 355

Dependent CLAIM 355 is directed to a combination according to anyone of claims 77 to 81, 186, 379 or 380, wherein the mixed copper oxide composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 356

Dependent CLAIM 356 is directed to a device according to anyone of claims 124 to 127, wherein the composition of matter can be made according to known principles of ceramic science.
Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 357

Dependent CLAIM 357 is directed to an apparatus according to anyone of claims 190 to 194, 225 to 229, 231, 256, 257, 266, 267, 271, 272, 281 to 284, 317 to 319, 407, or 411 to 413, wherein the composition of matter can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 358 is allowed.

CLAIM 359

Dependent CLAIM 359 is directed to an apparatus according to anyone of claims 195 or 230, wherein the copper oxide composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 360

Dependent CLAIM 360 is directed to an apparatus according to anyone of claims 286 or 321, wherein the copper oxide composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 361

Independent CLAIM 361 is directed to a superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining the composition at the temperature to exhibit the superconductivity and means for passing an electrical superconducting current through the composition while exhibiting the superconductivity.

Support for claim this claim is the same as for claim 1.

CLAIM 362

Independent CLAIM 362 is directed to he superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of the rare earth or element comprising a rare earth characteristic in the composition.

Support for claim this is the same as for claim 2.

CLAIM 362

Independent CLAIM 363 is directed to the superconducting apparatus of claim 362, where the rare earth or element comprising a rare earth characteristic is selected from the group consisting of La, Nd, and Ce.

Support for claim this is the same as for claim 6.

CLAIM 364

CLAIM 364 The superconducting apparatus of claim 361, where the phase is crystalline with a structure comprising a perovskite characteristic.

Support for claim this is the same as for claim 7.

CLAIM 365

Dependent CLAIM 365 is directed to the superconducting apparatus of claim 362, where the phase is crystalline with a structure comprising a perovskite characteristic.

Support for claim this is the same as for claim 8.

CLAIM 366

Dependent CLAIM 366 is directed to the superconducting apparatus of claim 361, where the phase exhibits a crystalline structure comprising a layered characteristic.

Support for claim this is the same as for claim 9.

CLAIM 367

Dependent CLAIM 367 is directed to the combination of claim 15, where the additional element is a rare earth or an element comprising a rare earth characteristic.

Support for claim this is the same as for claim 17.

CLAIM 368

Dependent CLAIM 368 is directed to the combination of claim 12, where the composition includes a superconducting phase comprising a perovskite characteristic.

Support for claim this is the same as for claim 19.

CLAIM 369

Dependent CLAIM 369 is directed to the combination of claim 20, where the substituted transition metal oxide has a structure comprising a layered characteristic.

Support for claim this is the same as for claim 23.

CLAIM 370

Dependent CLAIM 370 is directed to the superconducting apparatus of claim 31, where the crystalline structure comprises a layered characteristic, enhancing the number of Jahn-Teller polarons in the composite.

Support for claim this is the same as for claim 32.

CLAIM 371

Dependent CLAIM 371 is directed to the superconductive apparatus of claim 48, where the substitutions include a rare earth or an element comprising a rare earth characteristic.

Support for claim this is the same as for claim 52.

CLAIM 372

Independent CLAIM 372 is directed to a superconductive apparatus comprised of a copper oxide comprising a crystalline structure comprising a layered characteristic and at least one additional element substituted in the crystalline structure, the structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.

Support for this claim is the same as for claim 53.

CLAIM 373

Independent CLAIM 373 is directed to a combination, comprised of:

a copper oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in the oxide, the oxide being crystalline and comprising a structure comprising a layered characteristic,

means for passing a superconducting current through the copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than the superconducting onset temperature, and

means for cooling the copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than the superconducting onset temperature.

Support for claim this is the same as for claim 58.

CLAIM 374

Independent CLAIM 374 is directed to a combination, comprised of:

a material comprising a ceramic characteristic comprising an onset of superconductivity at an onset temperature greater than or equal to 26°K,

means for passing a superconducting electrical current through the material comprising a ceramic characteristic while the material is maintained at a temperature greater than or equal to 26°K and less than the onset temperature, and

means for cooling the superconducting material having a ceramic characteristic to a superconductive state at a temperature greater than or equal to 26°K and less than the onset temperature, the material being superconductive at temperatures below the onset temperature and a ceramic at temperatures above the onset temperature.

Support for claim this is the same as for claim 59.

CLAIM 375 is allowed.

CLAIM 376

CLAIM 376 The combination of claim 71, where the mixed copper oxide further includes a rare earth or an element comprising a rare earth characteristic.
Support for claim this is the same as for claim72.

CLAIM 377 withdrawn.

CLAIM 378 withdrawn.

CLAIMS 379, 380 and 381 are allowed.

CLAIM 382

Dependent CLAIM 382 is directed to the apparatus of claim 93, where the copper oxide material exhibits a crystalline structure comprising a layered characteristic.

Support for claim this is the same as for claim 94.

CLAIM 383

Independent CLAIM 383 is directed to a superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) means for causing an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 96.

CLAIMS 384 to 388 are allowed.

CLAIM 389

Independent CLAIM 389 is directed to a superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a

perovskite characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) causing an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 149.

CLAIMS 390 to 393 are allowed.

CLAIM 394

Independent CLAIM 394 is directed to an apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 165.

CLAIM 395

Independent CLAIM 395 is directed to an apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 166.

CLAIMS 396 to 401 are allowed.

CLAIM 402

Independent CLAIM 402 is directed to an apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to $26^{o}K$, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductor transition temperature T_c of greater than or equal to $26^{o}K$;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to $26^{o}K$ and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 240.

CLAIMS 403 to 406 are allowed.

CLAIM 407

CLAIM 407 An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to $26^{o}K$, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound

comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 256.

CLAIM 408

Independent CLAIM 408 is directed to an apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support for claim this is the same as for claim 257.

CLAIMS 409 to 413 are allowed.

CLAIM 414

Dependent CLAIM 414 is directed to a superconducting apparatus according to anyone of claims 361-365 or 366, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 415

Dependent CLAIM 415 is directed to a superconducting combination according to anyone of claims 367, 368 or 369, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 416

Dependent CLAIM 416 is directed to a superconducting apparatus according to anyone of claims 370 or 371, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 417

Dependent CLAIM 417 is directed to a superconducting apparatus according to claim 372, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 418

Dependent CLAIM 418 is directed to a combination according to claim 373, wherein the copper oxide can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 419

Dependent CLAIM 419 is directed to a combination according to claim 374, wherein the material can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 420

Dependent CLAIM 420 is directed to a apparatus according to claim 375, wherein the composition can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 421

Dependent CLAIM 421 is directed to a combination according to claim 376, wherein the mixed copper oxide can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 422

Dependent CLAIM 422 is directed to a combination according to anyone of claims 379 or 380, wherein the mixed copper oxide can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 423

Dependent CLAIM 423 is directed to a apparatus according to claim 382, wherein the copper oxide material can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 424

Dependent CLAIM 424 is directed to a superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein the composition can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 425

Dependent CLAIM 425 is directed to a apparatus according to claim 388, wherein the composition can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 426

Dependent CLAIM 426 is directed to a superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein the superconductive composition can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 427

Dependent CLAIM 427 is directed to a apparatus according to anyone of claims 402 to 412 or 413, wherein the superconductive composition can be made by known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 428

Independent CLAIM 428 is directed to an apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to $26^{o}K$, comprising:

a superconductive element comprising a superconductive composition, the superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

the composition comprising a superconductor transition temperature T_c of greater than or equal to $26^{o}K$.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu,

CLAIM 429

Dependent CLAIM 429 is directed to an apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26^{o}K and below the superconductor transition temperature T_c of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20

and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

CLAIM 430

Dependent CLAIM 430 is directed to an apparatus according to claim 428, wherein the composition comprises a substantially layered structure.

Support is found in original claim 32 at page 35 of the specification. Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 431

Dependent CLAIM 431 is directed to an apparatus according to claim 429, wherein the composition comprises a substantially layered structure.

Support is found in original claim 32 at page 35 of the specification. Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article

states “[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure.”

CLAIM 432

Dependent CLAIM 432 is directed to an apparatus according to anyone of claims 428 to 430 or 431, wherein the composition comprises a substantially perovskite crystal structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants’ article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom “X-ray powder diffractograms ... revealed three individual crystallographic phases.” In the conclusion at page 192 the article states “[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure.”

CLAIM 433

Dependent CLAIM 433 is directed to an apparatus according to any one of claims 428 to 430 or 431, wherein the composition comprises a perovskite-like structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants’ article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom “X-ray powder diffractograms ... revealed three

individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 434

Dependent CLAIM 434 is directed to an apparatus according to any one of claims 428 to 430 or 431, wherein the composition comprises a perovskite characteristic.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 435

Dependent CLAIM 435 is directed to an apparatus according to any one of claims 428 to 430 or 431, wherein the composition comprises a perovskite related structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col.,

lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 436

Dependent CLAIM 436 is directed to an apparatus according to anyone of claims 428 to 431 or 432, wherein the composition can be made according to known principals of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 437

Dependent CLAIM 437 is directed to an apparatus according to claim 88 wherein the composition is an oxide.

Support can be found in the specification at page 11, line 19-24; page 15, line 10-15; and original claim 46 at page 39.

CLAIM 438

Independent CLAIM 438 is directed to an apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in the means for conducting a superconducting current.
Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the

specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2 and page 18, line 20. Means for conducting a superconducting current at a temperature greater than or equal to 26°K are described at page 3, line 1 to page 28, line 5 of the specification. Means for providing an electric current is a conventionally used source or current shown in Fig, 1 as the combination of elements 2 and 18.

CLAIM 439

Dependent CLAIM 439 is directed to an apparatus according to claim 438, wherein the means for conducting a superconductive current comprises a T_c greater than or equal to 26°K.

Support can be found in the sentence bridging pages 5 and 6 of the specification.

CLAIM 440

Dependent CLAIM 440 is directed to an apparatus according to claim 438, further including a temperature controller for maintaining the means for conducting a superconducting current at the temperature.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 443

CLAIM 441 An apparatus according to anyone of claims 438, 439 or 440, wherein the means for conducting a superconducting current comprises oxygen.

Support can be found in the specification at page 11, line 19-24; page 15, line 10-15; and original claim 46 at page 39.

CLAIM 442

Dependent CLAIM 442 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises one or more of the groups consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 443

Dependent CLAIM 443 is directed to an apparatus according to anyone of claims 438, 439 or 440, wherein the means for conducting a superconducting current comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 444

Dependent CLAIM 444 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a layered structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 445

Dependent CLAIM 445 is directed to An apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a substantially perovskite structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 446

Dependent CLAIM 446 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a perovskite-like structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 447

Dependent CLAIM 447 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a perovskite related structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 448

Dependent CLAIM 448 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a structure having a perovskite characteristic.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 449

Dependent CLAIM 449 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 450

Dependent CLAIM 450 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a copper oxide.

Support can be found in original claims 24 and 26 on pages 23 – 24 of the specification.

CLAIM 451

Dependent CLAIM 451 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises oxygen in a nonstoichiometric amount.

Support can be found at Page 11, lines 9-16, page 26 line 13 – 15, original claim 81 and 82 page 51, original claim 84 at page 52, original claim 86 at page 52-53 of the specification.

CLAIM 452

Dependent CLAIM 452 is directed to an apparatus according to anyone of claims 438, 439 and 440, wherein the means for conducting a superconducting current comprises a multivalent transition metal.

Support can be found in original claim 66 at pages 45-46 of the specification.

CLAIM 453

Dependent CLAIM 453 is directed to an apparatus according to anyone of claims 438, 439 or 440, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 454

Dependent CLAIM 454 is directed to an apparatus according to claim 441, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 455

Dependent CLAIM 455 is directed to an apparatus according to claim 442, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 456

Dependent CLAIM 456 is directed to an apparatus according to claim 443, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 457

Dependent CLAIM 457 is directed to an apparatus according to claim 444, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 458

Dependent CLAIM 458 is directed to an apparatus according to claim 445, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 459

Dependent CLAIM 459 is directed to an apparatus according to claim 446, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 460

Dependent CLAIM 460 is directed to an apparatus according to claim 447, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 461

Dependent CLAIM 461 is directed to an apparatus according to claim 448, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 462

Dependent CLAIM 462 is directed to an apparatus according to claim 449, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 463

Dependent CLAIM 463 is directed to an apparatus according to claim 450, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 464

Dependent CLAIM 464 is directed to an apparatus according to claim 451, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 465

Dependent CLAIM 465 is directed to an apparatus according to claim 452, wherein the means for conducting a superconducting current can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 466

Independent CLAIM 466 is directed to an apparatus comprising:

a superconductive current carrying element comprising a T_c greater than or equal to 26 K

the superconductive current carrying element comprises a property selected from one or more of the group consisting of a mixed valent oxide, a transition metal, a mixed valent transition metal, a perovskite structure, a perovskite-like structure, a perovskite related structure, a layered structure, a stoichiometric or nonstoichiometric oxygen contents and a dopant.

Support is found in original claim 64 at pages 44 to 45 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support can be found at Page 11, lines 9-16, page 26 line 13 – 15, original claim 81 and 82 page 51, original claim 84 at page 52, original claim 86 at page 52-53 of the specification.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

Support is at original claim 36 at page 36.of the specification. Support is found at page 26, lines 1-15.of the specification. Support is found in original claim 44 on page 38 of the specification and original claim 39 at page 37 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 467

Dependent CLAIM 467 is directed to an apparatus according to claim 466, wherein the superconductive current carrying element is at a temperature greater than or equal to 26 K

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification

CLAIM 468

Dependent CLAIM 468 is directed to an apparatus according to claim 466, further including a temperature controller for maintaining the superconductive current carrying element at a temperature less than the T_c.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 469

Dependent CLAIM 469 is directed to an apparatus according to anyone of claims 466, 467 or 468, wherein the superconductive current carrying element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 470

Dependent CLAIM 470 is directed to an apparatus according to anyone of claims 466, 467 or 468, wherein the superconductive current carrying element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 471

Dependent CLAIM 471 is directed to an apparatus according to claim 469, wherein the superconductive current carrying element comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 472

Dependent CLAIM 472 is directed to an apparatus according to claim 470, wherein the superconductive current carrying element comprises a transition metal

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 473

Dependent CLAIM 473 is directed to an apparatus according to anyone of claims 466, 467, or 468, wherein the superconducting current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 473

Dependent CLAIM 474 is directed t an apparatus according to of claim 471, wherein the superconducting current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 475

Dependent CLAIM 475 is directed to an apparatus according to of claim 472, wherein the superconducting current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 476

Independent CLAIM 476 is directed to an apparatus comprising:

a superconductive current carrying element comprising a T_c greater than or equal to 26 K;

the superconductive current carrying element comprises an oxide, a layered perovskite structure or a layered perovskite-like structure and comprises a stoichiometric or nonstoichiometric oxygen content.

Support can be found at Page 11, lines 9-16, page 26 line 13 – 15, original claim 81 and 82 page 51, original claim 84 at page 52, original claim 86 at page 52-53 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 477

Dependent CLAIM 477 is directed to an apparatus according to claim 476, wherein the superconductive current carrying element is at a temperature greater than or equal to 26 K.

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification

CLAIM 478

Dependent CLAIM 478 is directed to an apparatus according to claim 476, further including a temperature controller for maintaining the superconductive current carrying element at a temperature less than the T_c.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 479

Dependent CLAIM 479 is directed to an apparatus according to anyone of claims 476, 477 or 478, wherein the superconductive current carrying element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 480

CLAIM 480 An apparatus according to anyone of claims 476, 477 or 478, wherein the superconductive current carrying element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is

found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 481

Dependent CLAIM 481 is directed to an apparatus according to claim 479, wherein the superconductive current carrying element comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 482

Dependent CLAIM 482 is directed to an apparatus according to claim 480, wherein the superconductive current carrying element comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 483

Dependent CLAIM 483 is directed to an apparatus according to claim 476, wherein the superconductive current carrying element comprises copper oxide.

Support can be found in original claims 24 and 26 on pages 23 – 24 of the specification.

CLAIM 484

Dependent CLAIM 484 is directed to an apparatus according to anyone of claims 476, 477 or 478, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 485

Dependent CLAIM 485 is directed to an apparatus according to claim 479, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 486

Dependent CLAIM 486 directed to an apparatus according to claim 480, wherein the superconductive current carrying element can be made according to known principles of ceramic science.
Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 487

Dependent CLAIM 487 is directed to an apparatus according to claim 481, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 488

Dependent CLAIM 488 is directed to an apparatus according to claim 482, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 489

Dependent CLAIM 489 is directed to an apparatus according to claim 483, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 490

Dependent CLAIM 490 is directed to an apparatus according to claim 484, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 491

Dependent CLAIM 491 is directed to an apparatus according to claim 485, wherein the superconductive current carrying element can be made according to known principles of ceramic science.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 492

CLAIM 492 The superconducting apparatus of claim 361, where the phase is crystalline with a structure comprising a perovskite related structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 493

Dependent CLAIM 493 is directed to the superconducting apparatus of claim 362, where the phase is crystalline with a structure comprising a perovskite related structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 494

Dependent CLAIM 494 is directed to the combination of claim 12, where the composition includes a superconducting phase comprising a perovskite related structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 495

Dependent CLAIM 495 is directed to the combination of claim 379, wherein the crystalline structure comprises a perovskite related structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three

individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 496

Independent CLAIM 496 is directed to a superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite related structure and a layered characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) means for causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2 and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.

Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 497

Independent CLAIM 497 is directed to a superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{q=o}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) means for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{q=o}$ of the superconductive composition; and

(c) means for causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 498

Independent CLAIM 498 is directed to a superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.

Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 499

Independent CLAIM 499 is directed to a superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 500

Independent CLAIM 500 is directed to an apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 501

Independent CLAIM 501 is directed to an apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=o}$ of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 502 to 507 are allowed.

CLAIM 508

CLAIM 508 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 509

Independent CLAIM 509 is directed to an apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26^{o}K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26^{o}K, the superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26^{o}K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and

Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 510

Independent CLAIM 510 is directed to an apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26^oK;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.
Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIMS 511 to 515 are allowed.

CLAIM 516

CLAIM 516 An apparatus of claim 146 wherein the means for carrying a superconductive current is comprised of an oxide.

Support can be found at Page 11, lines 9-16, page 26 line 13 – 15, original claim 81 and 82 page 51, original claim 84 at page 52, original claim 86 at page 52-53, original claims 40 and 41 at page 38 and original claims 88 to 90 at pages 53 - 54 of the specification. ,

CLAIM 517

Independent CLAIM 517 is directed to an apparatus comprising:

a superconductive current carrying element comprising a T_c greater than or equal to 26 K

the superconductive current carrying element comprises a metallic, oxygen-deficient, perovskite-like, mixed valent copper compound.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.
Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 518

Dependent CLAIM 518 is directed to an apparatus according to claim 517, wherein the superconductive current carrying element is at a temperature greater than or equal to 26 K

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification

CLAIM 519

Dependent CLAIM 519 is directed to an apparatus according to claim 517, further including a temperature controller for maintaining the superconductive current carrying element at a temperature less than the T_c.

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification

CLAIM 520

Dependent CLAIM 520 is directed to an apparatus according to anyone of claims 517, 518 or 519, wherein the superconductive current carrying element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 521

Dependent CLAIM 521 is directed to an apparatus according to anyone of claims 517, 518 or 519, wherein the superconductive current carrying element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 522

Independent CLAIM 522 is directed to an apparatus comprising:

a superconductive current carrying element comprising a T_c greater than or equal to 26 K;

the superconductive current carrying element comprises a composition that can be made according to known principles of ceramic science.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, page 12 lines 6-8 and page 18, line 20 and in original claim 42 at page 38 of the specification. Support is found in original claim 10 at page 31 of the specification.

Support is found in the specification at page 8, lines 19-13 and page 15, line 20-23.

CLAIM 523

Dependent CLAIM 523 is directed to an apparatus according to claim 522, wherein the superconductive current carrying element is at a temperature greater than or equal to 26 K.

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification.

CLAIM 524

Dependent CLAIM 524 is directed to an apparatus according to claim 523, further including a temperature controller for maintaining the superconductive current carrying element at a temperature less than the T_c.

Support can be found in original claim 58 at pages 42 -43 and at Page 4, lines 10 -21 of the specification

CLAIM 525

CLAIM 525 An apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and

rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 526

CLAIM 526 An apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Support is found in the specification page 3, lines 10-15, page 5, line 1 to page 6, line 14, the paragraph bridging pages 6 and 7 of the specification. Support is found in original claim 81 at page 51 of the specification. The alkaline earth and rare earth elements include Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

CLAIM 527

Dependent CLAIM 527 is directed to an apparatus according to claim 525, wherein the superconductive current carrying element comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 528

Dependent CLAIM 528 is directed to an apparatus according to claim 526, wherein the superconductive current carrying element comprises a transition metal.

Support can be found in original claims 40 and 41 at page 38, original claims 88 and 90 at page 54 of the specification.

CLAIM 529

Dependent CLAIM 529 is directed to an apparatus according to claim 522, wherein the superconductive current carrying element comprises copper oxide.

Support can be found in original claims 24 and 26 on pages 23 – 24 of the specification.

CLAIM 529

Dependent CLAIM 530 is directed to an apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element is substantially perovskite.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 531

Dependent CLAIM 531 is directed to an apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises a perovskite-like structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 532

Dependent CLAIM 532 is directed to an apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises a perovskite related structure.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 533

Dependent CLAIM 533 is directed to an apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises a nonstoichiometric amount of oxygen.

Support can be found at Page 11, lines 9-16, page 26 line 13 – 15, original claim 81 and 82 page 51, original claim 84 at page 52, original claim 86 at page 52-53 of the specification.

CLAIM 534

Dependent CLAIM 534 is directed to an apparatus according to anyone of claims 522, 523 or 524, wherein the superconductive current carrying element comprises a layered structure.

Support is found in original claim 32 at page 35 of the specification.
Support is found in original claim 9 at page 30 of the specification.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 535

Independent CLAIM 535 is directed to an apparatus comprising a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, the superconductor being comprised of at least four elements, none of which is a means for carrying a superconducting current at a temperature greater than or equal to 26°K, means for maintaining the superconductor at an operating temperature in excess of the onset temperature to maintain the superconductor in a superconducting state and means for passing current through the superconductor while in the superconducting state.

Support is found in original claim 40 at page 38 of the specification and in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of

the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20. Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 536

CLAIM 536 is directed to an apparatus comprising:

a means for carrying a superconductive current exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a cooler for cooling the composition to a temperature greater than or equal to 26°K at which temperature the means for carrying a superconductive current exhibits the superconductive state, and

a current source for passing an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2 and page 18, line 20. Means for conducting a superconducting current at a temperature greater than or equal to 26°K are described at page 3, line 1 to page 28, line 5 of the specification. Means for providing an electric

current is a conventionally used source or current shown in Fig, 1 as the combination of elements 2 and 18.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 537

Independent CLAIM 537 is directed to an apparatus comprising:

a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a temperature controller maintaining the composition at a temperature greater than or equal to 26°K at which temperature the composition exhibits the superconductive state, and

a current source passing an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2 and page 18, line 20. Means for conducting a superconducting current at a temperature greater than or equal to 26°K are described at page 3, line 1 to page 28, line 5 of the specification. Means for providing an electric current is a conventionally used source or current shown in Fig, 1 as the combination of elements 2 and 18.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

Support is found in Applicants' article, which is incorporated in Applicants specifications at page 6 (Brief Attachment AX) states at page 190, left Col., lines 14-16 from the bottom "X-ray powder diffractograms ... revealed three individual crystallographic phases." In the conclusion at page 192 the article states "[t]he system consists of three phases, one of them having a metallic perovskite-type layer-like structure."

CLAIM 538

Dependent CLAIM 538 is directed to the apparatus of claim 537, where the means for carrying a superconductive current is comprised of a metal oxide.

Support is in original claim 89 on page 54 of the specification.

CLAIM 539

Dependent CLAIM 539 is directed to the apparatus of claim 537, where the means for carrying a superconductive current is comprised of a transition metal oxide.

Support is in original claim 90 on page 54 of the specification.

CLAIM 540

Independent CLAIM 540 is directed to an apparatus comprising:

a composition comprising oxygen exhibiting a superconductive state at a temperature greater than or equal to 26^{o}K, a temperature controller for

maintaining the composition at a temperature greater than or equal to 26°K at which temperature the composition exhibits the superconductive state, and

a source of an electrical current through the composition while the composition is in the superconductive state.

Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50),84 (page 52) and 88 (page 53 to 54) (of the specification), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20 line 1 to page 21, line 2 and page 18, line 20. Means for conducting a superconducting current at a temperature greater than or equal to 26°K are described at page 3, line 1 to page 28, line 5 of the specification. Means for providing an electric current is a conventionally used source or current shown in Fig, 1 as the combination of elements 2 and 18.

Support is in the specification at page 4, lines 10-21; page 23, line 1-9; and the paragraph bridging pages 2 and 3.

CLAIM 541

Dependent CLAIM 541 is directed to an apparatus according to claim 540, where the composition is comprised of a metal oxide.

Support is in original claim 89 on page 54 of the specification.

CLAIM 542

Dependent CLAIM 542 is directed to an apparatus according to claim 541, where the composition is comprised of a transition metal oxide.

Support is in original claim 90 on page 54 of the specification.

CLAIM 543

Independent CLAIM 543 is directed to a combination, comprising:

an oxygen containing composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, and

means for passing an electrical current through the composition while it is in the substantially zero resistance state.

Support is found at page 10, lines 1-3, page 20, lines 1-5 of the specification. Support is found in original claims 1 (page 29), 12 (page 31), 24 (pages 33-34), 36 (page 36), 55 (page 41), 58 (page 42), 59 (page 43), 64 (pages 44-45), 69 (page 46), 77 (pages 49-50), 84 (page 52) and 88 (page 53 to 54) (of the specification) and 88 (page 53 to 54), the title at page 1 of the specification and Fig. 1 elements 20, 18 and 16 thereof and the description at page 4, lines 10 to 21, at page 20, line 1 to page 21, line 2, and page 18, line 20 and in original claim 42 at page 38 of the specification.
Means for providing an electric current is a conventionally used source or current shown in Fig, 1 as the combination of elements 2 and 18.

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Respectfully submitted,

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